

STAHLMAN BEEKEEPING

NOTES FOR 2023

Vol. 5 Issue # 19 Brood Issues May 13, 2023

I am hearing from some beekeepers this week about hives that don't have queens or in one case the queen was observed but eggs could not be seen on frames being inspected. Cells did contain some larvae and capped brood.

At this time of the year, a hive without eggs is a big issue. Without looking at a hive myself, it is hard to answer the question: "Why?"

The normal brood cycle for honeybees is a build-up of brood in the spring with a maximum colony population leveling off during mid summer and the second phase is the decline in hive populations to low levels in the fall.

We are still in the population growth cycle in Raleigh. If a hive has a good queen, and the bees are returning to the hive with nectar and pollen, the hive/colony should have a good amount of brood in all stages of development.

The following photo gives me a chance to share what one should be seeing



when examining brood frames.

Eggs are hard to see.

When one looks to the bottom of cells on a frame and eggs are present – this is what you will see.

Only one egg to a cell. Two or three eggs to a cell should alert the beekeeper to a problem. [laying worker bees or new queen] That is another topic I will cover in an upcoming issue.

When eggs are placed in cells, they are for the most part centered in the bottom of the cell. If a day old, the eggs will stand upright. Eggs two or three days old lay over on their sides and when they hatch they become a small larvae – worm like creatures often seen floating in a white mass of bee food.

IMPORTANT POINTS

I like to quote beekeeping information and share the source I use to pass that information on to you.

Egg laying information is shared here from BEE SEX ESSENTIALS written by Larry Connor. If you are thinking about raising queens, I would suggest this book for your beekeeping library.

It is available on Kindle or in book form from Wicwas Press or Amazon.

During the four or five months of peak brood rearing a productive queen lays between 1,200 and 1,800 eggs per day.

A standard deep Langstroth frame holds about 150 square inches of brood per side.

Each square inch of brood produces about 25 cells.

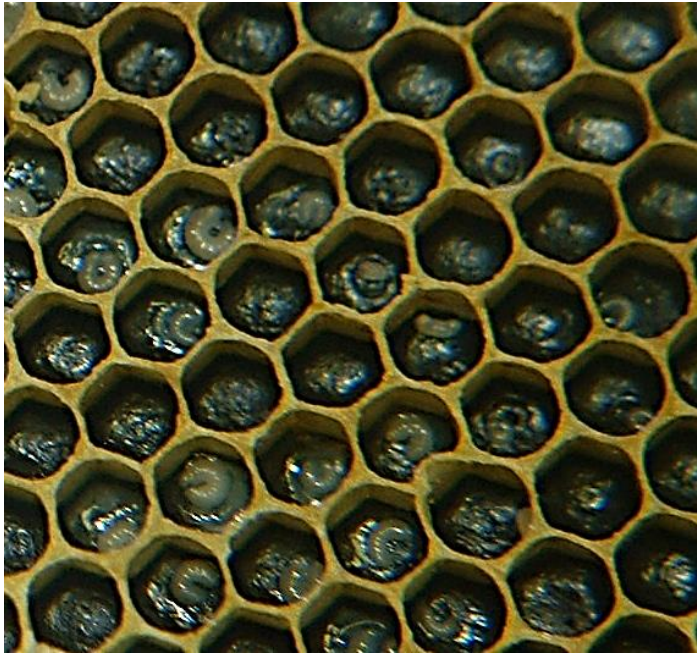
This means that a normal queen will have brood spread out over six to ten frames.

Just one full frame of capped brood will produce $300 \times 25 =$ bees. That is 300 square inches \times 25 bees per square inch = 7,500 bees.

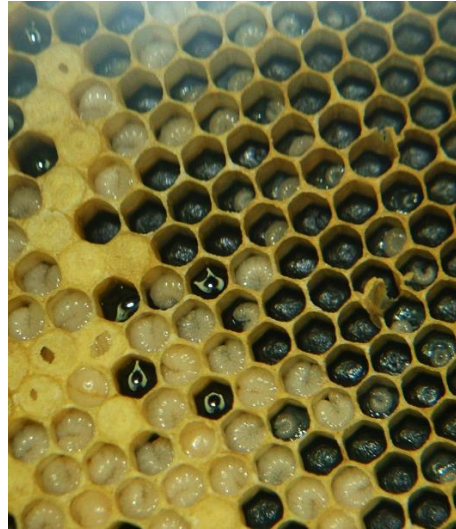
A pound of bees equals about 3,500 bees.

Most hives will not have completely filled brood frames. I hope these numbers give you an idea why a summer hive may have 60,000+ bees in it.

Larvae grow rapidly.



The two photos shown here are young larvae and larvae about to be capped over.



The expansion and growth of a colony with a good queen and large population of young worker bees is fast. Beekeepers are often caught off guard when a swarm issues from the hive. All above photos show what one should expect from a hive with a good queen.

The key to keeping bees is to recognize issues/problems before serious population declines occur to the colony.

Any interruption in the brood cycle has consequences for the colony. However brood interruptions do occur naturally in the yearly growth cycle of a colony of bees.

Natural interruptions:

- **Swarming:** The old queen leaves with a number of older bees. However left behind is a young virgin queen. Until she is mated and laying eggs herself, the colony will face a natural period of brood interruption lasting several weeks.
- **With reduced food resources, many queens lay fewer eggs.** This naturally occurs during mid summer after a honey flow ends.
- **Late fall as hive populations decline it is natural for a queen to stop laying eggs during the time bees are in the winter cluster -- weather conditions are too cold for bees to fly.** Note that daylight hours are shorter during winter and egg laying begins as daylight hours increase and weather conditions allow bee flights.

It is not normal for a queen at this juncture in time [May] to stop laying eggs unless the hive is at the point of starvation or there is a problem with the queen. Or maybe the eggs are not seen by the beekeeper but larva and capped brood can be seen.

Issue:

- **Declining bee population - there is a reason for that at this time of the season!**
 - **Queen failure – poorly mated queens, injured queen, disease, lack of food, laying workers.**
 - **Hive congestion leading to swarming – bees store honey in the brood chamber reducing the number of cells for the queen to place eggs.**
 - **Varroa mite population and small hive beetles become problem issues for the management of the hive.**

Biology: Queenless bees with eggs or young larva present can do something very special. They will build a queen cell over a worker cell base to raise another queen. By feeding the young larvae royal jelly – the worker larvae will develop into a virgin queen. The bees save themselves by raising a new queen.

Bees can replace a failing queen. This is called supersedure. Some hives – not sure why – will tolerate a poor laying queen for a long period of time. The decline is rapid – bees only live 40 days or so and this opens the hive to the many enemies that honeybees have including other honey bees that rob a hive of its honey supply.

The key for a hives survival at this time of the bee season is worker bees with a good laying queen. Varroa mites enter the picture late in the bee season. Small hives with good laying queens can build up during the summer bee season into colonies that will be prepared to

survive the winter season. This can be aided by a beekeeper using proper management techniques including feeding and mite control!

What is going on in a hive if you see this:



If you see a queen cell like the one shown here, the inspection can tell you that the hive is trying to requeen itself. This cell is built over an existing worker cell that had a young larvae in it. It is called the emergency queen cell response I mentioned above.

A colony can save itself by building cells like this but the hive is queenless until it can replace the old

queen. The brood interruption in this case is going to be longer than when a colony swarms. And it will take the colony longer to get back to building a good worker brood population. With both colonies [one that swarms and one that builds emergency queen cells] the beekeeper must be aware that it is important to check to make sure the new queen is laying well and that the worker bee population is growing. Hives like this require more attention than hives with bee brood in all stages of development. In either case – if the colony has no queen – it is bound to fail.

If you see any sign that a queen is failing, it is time to replace her. I will get into queen replacement next week but I would like to share some guidelines I use.

Things that cause me to requeen a hive:

- A hive with declining bee populations –mite related. If I take a mite count and it is high, it indicates to me that the bees in the hive are not mite resistant. I would need to treat for mites but I would also replace the queen with a line known for mite resistance.



- A hive with declining bee populations – I would check the brood patterns of the queen in the hive and replace her if I see something like this: I will enlarge this picture on the next page. There are signs that something is not right about this brood pattern. The frame includes some cells with larva and capped brood.



Note the number of scattered open cells. This indicates something is not quite right with the queen. This frame may indicate that the queen might not have been properly mated – too closely inbred. There are a few drone cells mixed in with worker cells. This may indicate that the sperm in her spermatheca is near depletion or the sperm

is not viable. This frame was taken from a hive with a new queen started with a 3 pound package of bees. Later inspections found frames with more drone brood than worker brood. That is a sign that the queen was not well mated – a problem often encountered with early queens.

This is a normal frame of brood as a way to compare the job being done by a queen.



There are some misses as can be seen but over all -- look at the uniformity of the brood pattern. Notice that the drone cells on this frame are all located below the bottom bar.

More will be coming on this topic -- replacing queens. But ask yourself – which queen would you rather have in your hive – the queen producing brood like the top frame or the queen producing brood like you see in the bottom frame?